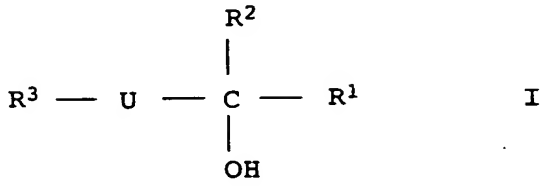
Preparation of α-oxidized carbonyl compounds

Abstract

A process for the preparation of a compound of the general formula I



I

where R^1, R^2, R^3 are hydrogen, C_1- to C_{20}-alkyl, C_2- to C_{20}-alkenyl, C_2- to C_{20}-alkynyl, C_3- to C_{12}-cycloalkyl, C_4- to C_{20}-cycloalkyl–alkyl, C_1- to C_{20}-hydroxyalkyl, or aryl or C_7- to C_{20}-arylalkyl which is unsubstituted or substituted by C_1- to C_8-alkyl, C_1- to C_8-alkoxy, halogen, C_1- to C_4-haloalkyl, C_1- to C_4-haloalkoxy, phenyl, phenoxy, halophenyl, halophenoxy, carboxyl, C_2- to C_8-alkoxycarbonyl or cyano, or R^1 and R^2 or R^3 together are a C_2- to C_9-alkandiyl unit which is unsubstituted, monosubstituted or disubstituted by C_1- to C_8-alkyl, C_1- to C_8-alkoxy and/or halogen and in which one or two methyl groups may also be replaced by a (CH=CH) unit and R^3 is additionally an acetylated carbonyl group in which the alkoxy groups are derived from an alcohol of the general formula II

$$R^4\text{-OH} \qquad \text{II}$$

where R^4 is C_1- to C_6-alkyl, and

U is an acetylated carbonyl group in which the alkoxy groups are derived from an alcohol of the general formula II, or is a compound of the general formula III

$$R^3\text{—}V\text{—}W\text{—}R^1 \qquad \text{III}$$

where R^1 is as defined under the formula I, and R^3 is exclusively aryl which is unsubstituted or substituted by C_1- to C_8-alkyl, C_1- to C_8-alkoxy, halogen, C_1- to C_4-haloalkyl, C_1- to C_4-haloalkoxy, phenyl, phenoxy, halophenyl, halophenoxy, carboxyl, C_2- to C_8-alkoxycarbonyl or cyano,

V is a carbonyl group or is as defined for U under the formula I, and

W is as defined for V, with the proviso that one of the groups V and W is a carbonyl group and the other is an acetylated carbonyl group,

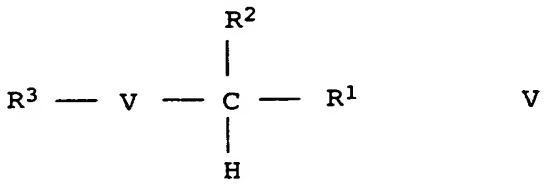
or

a compound of the general formula IV

$$R^3—V—W—O—R^4 \qquad IV$$

where R^4 is as defined under the formula II, V and W are as defined under the formula II, and R^3 is as defined under the formula III,

by subjecting a compound of the general formula V



V

where V, R^1, R^2 and R^3 are as defined under the formula I or III, with the proviso that

- in the case where a compound of the formula III is desired, use is only made of a compound Va in which

  R^1 is exclusively hydrogen and

  R^3 is exclusively aryl which is unsubstituted or substituted by C_1- to C_8-alkyl, C_1- to C_8-alkoxy, halogen, C_1- to C_4-haloalkyl, C_1- to C_4-haloalkoxy, phenyl, phenoxy, halophenyl, halophenoxy, carboxyl, C_2- to C_8-alkoxycarbonyl or cyano, and

- in the case where a compound of the formula IV is desired, use is only made of a compound Vb in which

  R^1 and R^2 are exclusively hydrogen,

R^3 is exclusively aryl which is unsubstituted or substituted by C_1- to C_8-alkyl, C_1- to C_8-alkoxy, halogen, C_1- to C_4-haloalkyl, C_1- to C_4-haloalkoxy, phenyl, phenoxy, halophenyl, halophenoxy, carboxyl, C_2- to C_8-alkoxycarbonyl or cyano,

to an electrochemical reaction with an alcohol of the general formula II in the presence of an auxiliary electrolyte and catalytic amounts of a metal salt (S) derived from a metal from the 1st, 2nd, 6th or 8th sub-group or from lead, tin or rhenium.

Abstract

A method for producing compounds which are oxidized in an alpha position by electrochemical reaction with alcohol in the presence of an auxiliary electrolyte and catalytic amounts of a metal salt.